

it emerged under No. 7514. The second larva in spirit under the No. 7513.

Egg.—Since writing the above I have received a female of the moth which deposited a batch of eggs. These are pea-green, 1.6mm. in length by 1.4 mm. broad, whitish at the head end and slightly flattened, and are laid in clusters with a number of hairs attached. Just before emergence a round black spot appears at the head with the dark body showing indistinctly under the shell on one round side for half its length. Remainder of shell becomes light brown with white markings. These markings appear as a brown backbone with alternate brown and white ribs (the latter not connected with the main rib however) on the dark side of the egg. In thickness between the flattened sides about 1.1mm.

Field Notes from Angola.

By MALCOLM BURR, D.Sc., F.E.S.

COHEMBA.

After the sandy, dry, rather monotonous high bush country in which we have been wandering for the past three months, it is a pleasant change to come down to Cohemba. Properly speaking this is the name of a small river that is a secondary tributary of the Cuanza, but at Kilo 782 on the Benguela Railway there is one of those volcanic dykes, which intersect the country here and there and produce waterfalls where they cut across the numerous rivers. The falls here at Cohemba are very fine, much surpassing those of the Luena; even at the close of the dry season there is plenty of water, and the fall is over a hundred feet, down into a narrow, rocky gorge. The abundance of moisture keeps the place green and the vegetation is luxuriant and here we really feel that we are in the tropics, a sensation which did not come to us in the dry high bush. The altitude is a little over 4000 ft., so the actual difference in height is only about a thousand feet and the milder weather is probably more to be attributed to the approach of spring than to the lower level.

The hard rock of the dyke weathers easily, decomposing into a red laterite, which is a fertile soil, welcome after the dry incoherent sands to which we have become accustomed. And the surprising thing is that there is a big farm here; it is well run, well equipped and modern, under German management, to whom we are indebted for much hospitality, and to the very welcome treat of fresh vegetables and fruit. After the almost gameless country where we have been living almost exclusively out of tins, it is a pleasure indeed to enjoy fresh meat from a roan or other buck, for here there is game, with fresh green vegetables, carrots, peas, spinach, cabbage, tomatoes and bananas, and, wonderful to relate, not only fresh milk, but strawberries and cream. The change is almost bewildering, and it seems that we have tumbled on to the one and only spot in Angola where there are strawberries to be had.

The fauna is richer, too, and I have come across a few fresh kinds of Orthoptera. I have already mentioned the striking green Acridian with scarlet and bright blue spots, and a new Truxalid with orange wings. Also, in the bogs I find a very minute cricket, nearly as

nimble as, and no bigger than, the *Tridactylus* which occurs with it. I am looking forward to taking the adult of the winged *Saga* mentioned in my last letter, and some of the *Oedipodidae* and *Stenobothridae* seem unfamiliar and at least one of the smaller Acridians.

In the richer ground below the falls I found a nymph of *Empusa*, apparently the same species that I took in the adult stage at Loanda in April; another interesting Mantid is a small, delicate grey creature, like an *Ameles* but longer and slimmer, with eyes like those of a hammer-headed shark; here there is an abundance of slender grass-like *Mesops*, some with smoky, some with yellow wings, and the odd-looking Opomalid with the bright silver lateral band. Another nice Mantid has a parallel sided pronotum as in the *Orthoderidae*, with prominent rounded eyes and I notice that, like *Pyrrgomantis*, it tucks its fore-legs away neatly into the pronotum, the curvatures of the lobes of which exactly fit the outline of the anterior femora. Another very striking Mantid is unfortunately only in the nymph stage, but it resembles a slender stick-insect; it is four inches long and only one eighth of an inch wide. The two handsome local Acridas are common enough, one with yellow wings banded with black, the other with a beautiful crimson tint.

Almost all the Orthoptera are of the reddish or yellow buff colour of the dried and withered grass except when they first hatch out, when they are green, which is probably the original colour of the creatures. The Acridas, for instance are all of a rather reddish than yellow tint, but one was bright green, evidently a freshly emerged specimen. The Acridians were generally paler than they were a month or two back. When the rains turn the grass green again they will be rather prominent; perhaps they will die off and be replaced by the younger generation which will be green. I hardly expect the buff ones will be able to revert to their original green. The phenomenon is just what we see with bananas; a hand of green bananas will ripen into the familiar yellow, but they will never go back to their youthful tint.

There are signs that the dry season is approaching its end. The gales are less frequent and less violent; the morning frosts are over, we hope for good, and the early mornings, though fresh enough, are not bitterly cold. Sometimes the mornings, sometimes the afternoons, are cloudy and the sun has more power and in the middle of the day can be quite hot. The last winds have stripped most of the trees of their dead leaves, which now carpet the floor of the forest, and the crackle of the dried shrubs and twigs speak of the end of a season. About half the trees around our camp are now stark and leaf-less. The pale and dessicated-looking Orthoptera, especially *Acrida* and a species of *Caloptenus*, remind me, too, of the autumn in Europe.

But alongside this autumn we have spring. The other half of the trees are covered with the most succulent young tender foliage, showing delightful russets, pinks and Venetian reds; in the distance this gives the effect of an October day in an English wood, but when near, the juicy and tender nature of the foliage can be seen. New plants are shooting up from the ground, with the promise of delightful flowers to come. The confusion of the seasons is bewildering to the newcomer; our farmer friends tell us that they get strawberries for six months in

the year, that is throughout the dry season, but the rains of course rot them; bananas they have all the year round, in profusion.

Bird life does not strike me as very exotic; on the bog near our camp are stonechats, not quite the same as ours, but very like them, and herons and storks, all resembling our old friends, but yet just a little bit different. I am sure the genera are the same. The other day a flock of eight storks wheeled overhead for several minutes; they had the red beak and legs and the black and white plumage all in order, only the black and white were arranged differently. Then a cuckoo flew over and cucked near the camp; it looked uncommonly like our old friend in flight and figure; the voice, too, was of the same timbre, but the note was monotonous. We see but few birds of prey and only now and then does some strange long-tailed widow-bird, or squawky and brilliant parrot give an exotic touch to the scene. The very bogs seem homelike; the water-beetles I am sure belong to our genera, only there are two species of *Gyrinus*, one double the size of ours; the water-bugs all have a familiar look, there is *Gerris* and *Ranatra*, which looks much more at home in African surroundings, where so many insects are long-drawn-out, than it does with us.

Below the falls I took that brilliant green and gold Pyrgomorphid, *Taphronota* sp., which I have noted from the Langiliko in a former letter. It was sitting on a tree with leaf, fruit and timber just like a walnut, and allowed me to pick him off with the fingers. The dark green elytra and femora harmonise perfectly with the leafy surroundings; the yellow tips to the antennae break the outline and give the impression of a flicker of sunlight through the trees, and when he flies, of course, the bright orange wings flash the same effect. It is the same thing that we see in the beautiful bee-eater, whose brilliant and varied plumage fits in so well with the bright sun's rays. One very strange bird is to be seen at dusk and occasionally flushed in the scrub during the day, when he flies off but a few yards and settles again on the ground, dazzled by the brilliant light: that is the local nightjar, figured in so many books on natural history, with long streaming racket-like feathers flowing from his wings; when he is flying the effect is very odd, for it looks in the dim twilight as though there were two birds flying interlocked. The churning note resembles ours, but is more woody and the frequency is less.

Experience in the field in Africa has confirmed up to the hilt my old opinion that in the Orthoptera, colour and pattern has no specific value. I am more and more inclined to believe that the two forms of common *Acrida*, which are common here, one with crimson, the other with yellow wings banded with black, are very probably but two forms of one and the same species, and breeding experiments would be very interesting; they occur together in the same places at the same time; the only other difference I can see in them is that the yellow-winged form is generally paler all over, while the crimson-winged form tends to have a general reddish tint.

There is an even more striking instance of what I consider polymorphism, in an allied genus; this is a small, ensiform Truxalid, like a small *Acrida*, but the elongation of the head less pronounced. It is this species which provided me with those surprising "burnt grasshoppers" from the Langiliko which formed the subject of an earlier letter. I have been taking here recently a very similar creature,

without the sooty tinge, and with bright orange wings; it occurs in the scrub. And this morning, on a grassy plain near a bog, which is burnt in patches, I have the following forms of what I believe will turn out to be one and the same species. (1) "burnt," with sooty fore part shading off; wings faintly blue with a black fascia; (2) similar, but not "burnt," with pale blue wings and no fascia; (3) similar, but with violet wings, or rather, raspberry coloured; (4) with orange wings; and (5) with colourless wings. Perhaps the latter is the same as the grey form so common in the forest. Now I took these all in the same spot at the same time. The coloration of the body varies with individuals; some are all buff, some have a green dorsal stripe, some a brown dorsal stripe, and some have the sooty shading and look exactly as though they had been charred in the fire and escaped with their lives. In Europe we are familiar with the occurrence of yellow wings in normally blue or crimson-winged *Oedipoda* but this seems to be a form of albinism, as suggested by Brunner, due to failure of pigmentation. But while the faint blue may be an albinistic variant of the red or raspberry colour, the yellow is too deep and too rich to be explainable by failure of pigmentation and must be a definite colouring. Probably it is an extremely plastic species, adapting itself freely to a varying environment and indulging in a fanciful variety of coloration in the wings, which, being exposed only during flight, are independent of adaptation to the surroundings.

AUGUST 31st, 1927.

Another Mantid to-day; this time a slender stick-like creature but much smaller than the ones previously reported; it is brachypterous and the wings are orange with a dark fascia, an unusual type of coloration in the Mantids; the general colour is fawn and it is clearly a grass-haunting species.

There is an Acridian which is abundant and I have taken it in every locality I have visited; it is rather a stoutish fellow, with oblique white bands on the sides. I am now taking it with distinctly yellow bands and the posterior tibiae are bright blue; this greater intensity of coloration may be due to the increasing humidity of the atmosphere and preparation for a livelier uniform during the approaching rainy season.

Animal life generally is more interesting here than in the higher woodlands of the watershed. On the open treeless valleys of the streams gazelle-like oribi are numerous enough and we sometimes get them for dinner, and venison is occasionally provided by roan; we see red buck, too, but have not yet shot one here. Game birds are commoner here as well, and we have seen, and sometimes shot, guinea-fowl, francolin, and a bustard that resembles *Houbara macqueeni*, a very beautiful bird too, with a strange, raucous voice. And this morning, to his great delight, Pavel Stepanovitch met a Secretary-Bird out for a walk; he was stalking buck, and abused the bird as it came walking along, for at first he mistook it for a man.

A new acquaintance to me is a small Acridian grasshopper about the size of an ordinary Stenobothrid with a pattern that is unusual in the Orthoptera; the first I took was pale grey blotched with chocolate and later specimens are of the same general pattern, though differing

in detail; the two colours are sharply contrasted. Also a Pyrgomorphid that is unfamiliar to me; it is of the same general structure as the *Pyrgomorpha* with violet wings that is so abundant, but is pale grey in colour, dotted with bright orange specks, and has bright orange wings. And now I have taken the adult form of a curious Mantid of which I reported a nymph from Busaco; it is a big fellow, long and slender and is remarkable in having a comb-like ridge on the fore trochanter; the elytra are short and lanceolate, dark blackish grey like the rest of the body, but with an orange discoidal spot; the wings are short, rounded, smoky black, decorated by a series of angular, transverse yellow lines between the radiating veins. It is probably a *Dauria* sp. ♀.

SCIENTIFIC NOTES AND OBSERVATIONS.

THE LARVAL FOOD OF *ATHOUS RHOMBEUS* (COL.).—On Dec. 2nd I went to Hut Wood near Southampton for the purpose of taking specimens of the longicorn *Mesosa nubila*. In this wood felling operations have been in progress for some years now, and the woodmen have thinned out the oaks each year in a different part of the wood. The beetle may be found rather sparingly in decaying branches from the tops of newly felled oaks, but it is plentiful in the branches left lying where they fell when trees were felled two years ago, for in this particular wood only the large timber is carted away, and the boughs and branches of moderate size are left to rot among the undergrowth. Several times I have found on splitting open the decaying branch, only the debris of *Mesosa nubila* in the cell where normally I find the living imago waiting for the Spring before biting its way out of the wood. I used to attribute the damage to Snakefly larvae, which are not scarce in dead and decaying oak branches, but on the date mentioned I found a living beetle in its cell with a coleopterous larva in the act of feeding upon it. There was a gaping hole in the underside of the abdomen, and when set free the beetle actually walked about with the larva still feeding upon it half hidden inside its abdomen. This coleopterous larva has been identified very kindly by Mr. H. Donisthorpe as that of *Athous rhombeus*, which is well known to feed on larvae and pupae of various kinds.—WM. FASSNIDGE (M.A., F.E.S.), 47, Tennyson Rd., Southampton.

NOTES ON *COLIAS CROCEUS* (EDUSA).—I was staying at Vernet-les-Bains, Pyrénées Orientales, from June 22nd to July 7th last; and I found *C. croceus* as abundant there, as it has been elsewhere, this year. Two or three observations on it may be worth recording.

1. *Food-plant.* I watched eight ovipositing ♀♀ very closely (including one of the *helice* form) and saw these eight examples deposit a total of 23 eggs under absolutely wild conditions. I found that, although there was plenty of clover both red and white—and the clover was very conspicuous, as well as vetches of several species; the females watched took no notice of any of these plants but searched the herbage until they found plants of the Birds' Foot Trefoil (*Lotus corniculatus*) which were inconspicuous and by no means easy to find; and every one of the 23 eggs was deposited on a plant of *Lotus corniculatus*.

2. *Vertical distribution.* On Canigou most of the common lowland